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Supporting Information

for *Adv. Sci.*, DOI: 10.1002/advs.202102405

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The PDF file includes:

Figure S1. Stability measurements of UV-vis extinction spectra and Raman intensity of GERTs incubated with (A) 0.5% PVP, (B) 0.5% PVP-Saline and (C) 0.5% PVP-10%FBS. The extinction spectrum of GERTs in 10% FBS is not recorded since the absorption of FBS overlaps with the resonance peak of GERTs.

Figure S2. Evolution of in vivo LN tracing and ex vivo LN SERS imaging at post-injection 24 h of GERTs. (A) Photographs and enlarged images of SLN and 2nd LN at different post-injection time points of GERTs, and (B) the corresponding in vivo SERS spectra. (C) *Ex vivo* photographs, SERS images and the corresponding SERS spectra from the positions indicated

on the dissected SLN (arrow a) and 2nd LN (arrow b). All Raman images are plotted using the Raman band at 1338 cm^{-1}. The scale bars are 400 μm.

Figure S3. SERS and merge image of a dissected SLN and 2nd LN at different time points after GERTs injection. The scale bars are (A) 400 μm, (B) 750 μm and (C) 400 μm, respectively.

Figure S4. Total Raman spectra of 16 detection points by portable Raman scanner during SLN subcutaneous positioning. The acquisition parameter is 785 nm laser excitation, 400mW laser power density and 0.2s acquisition time. The scale bar is 5 mm.

Figure S5. GERTs achieve accurate preoperative positioning of SLN. (A to D) The marks on the skin are drawn with the same size on the glass, which used to confirm the SLN position after dissecting the skin. (E) Placed the glass slide over the skin and match the dots on the glass with the dots on the skin one by one while skin dissected. The point 7 on the slide completely coincides with the position of SLN in vivo. (F) Marks on the glass slide. (G) Light image and merge image of dissected SLN by a Raman confocal system. All Raman images are plotted using the Raman band at 1338 cm^{-1}. The scale bar are (B, C, E) 5 mm and (G) 200 μm.

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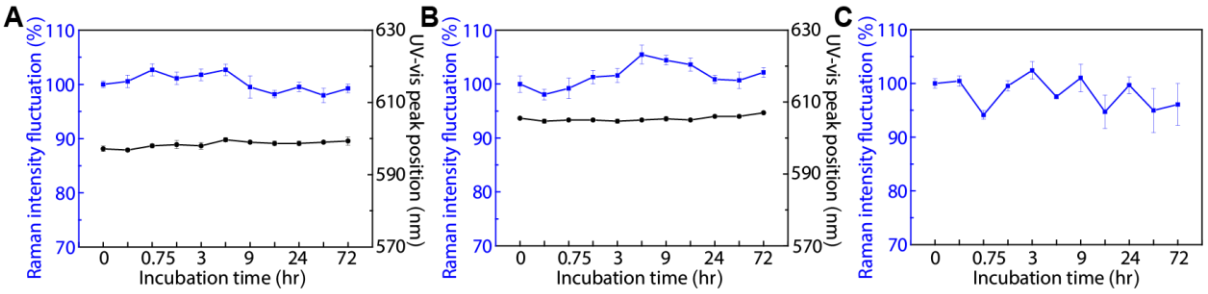

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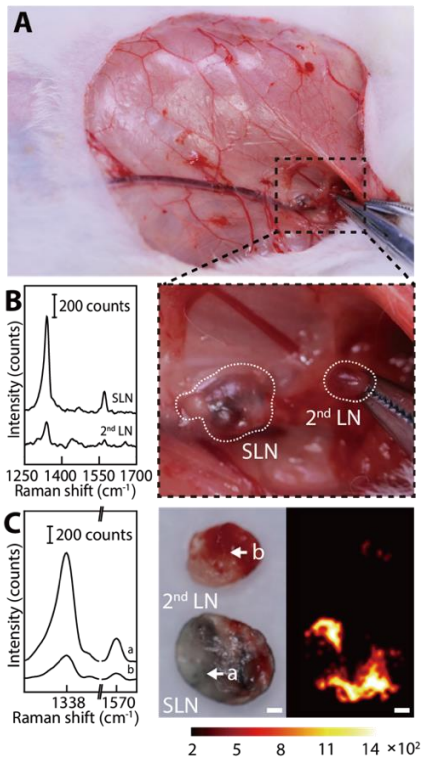

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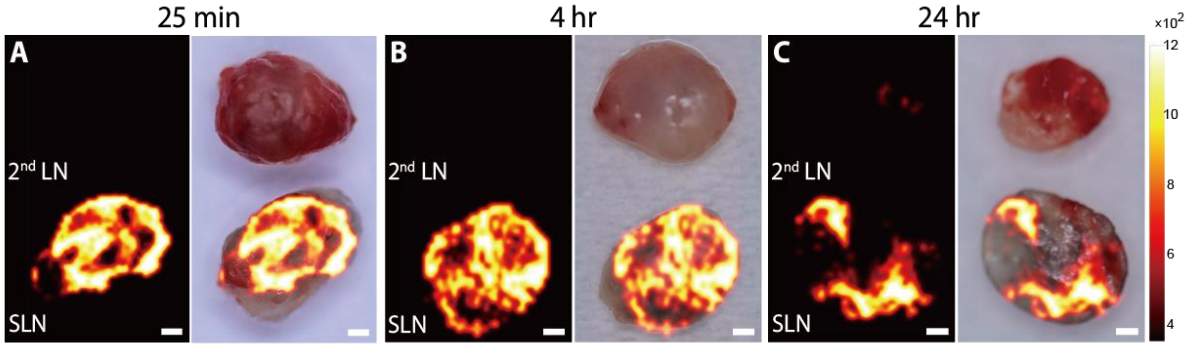

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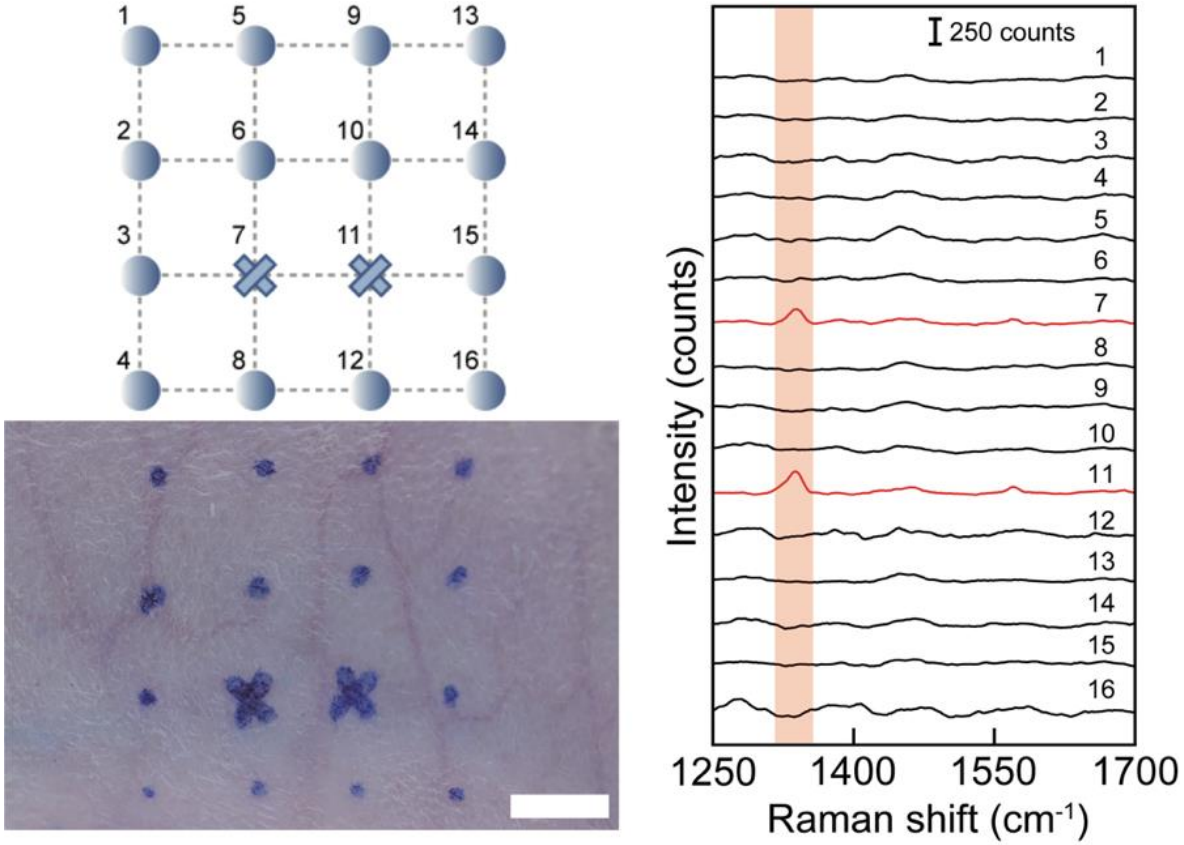

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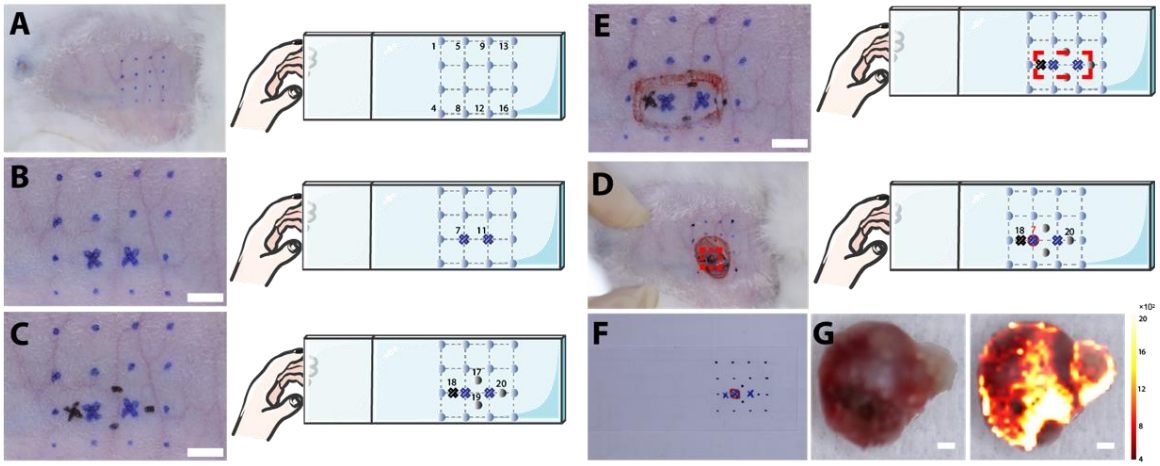

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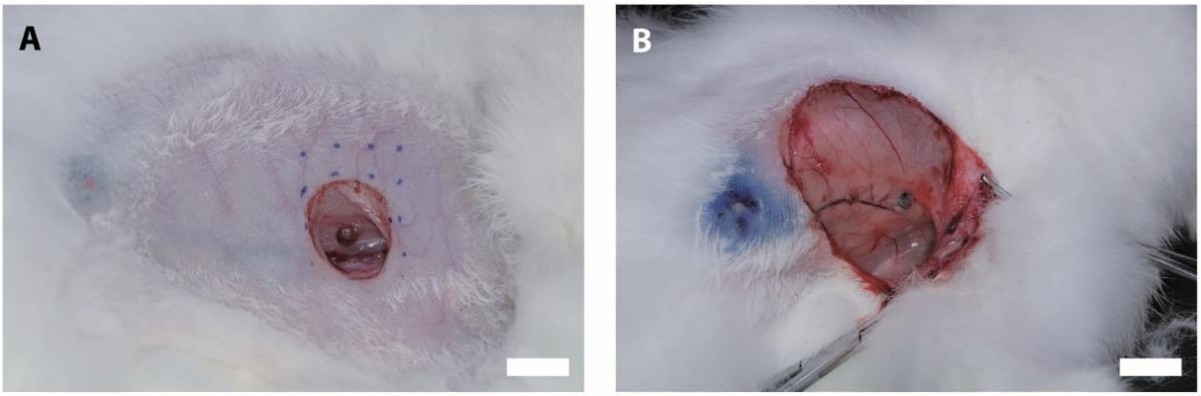

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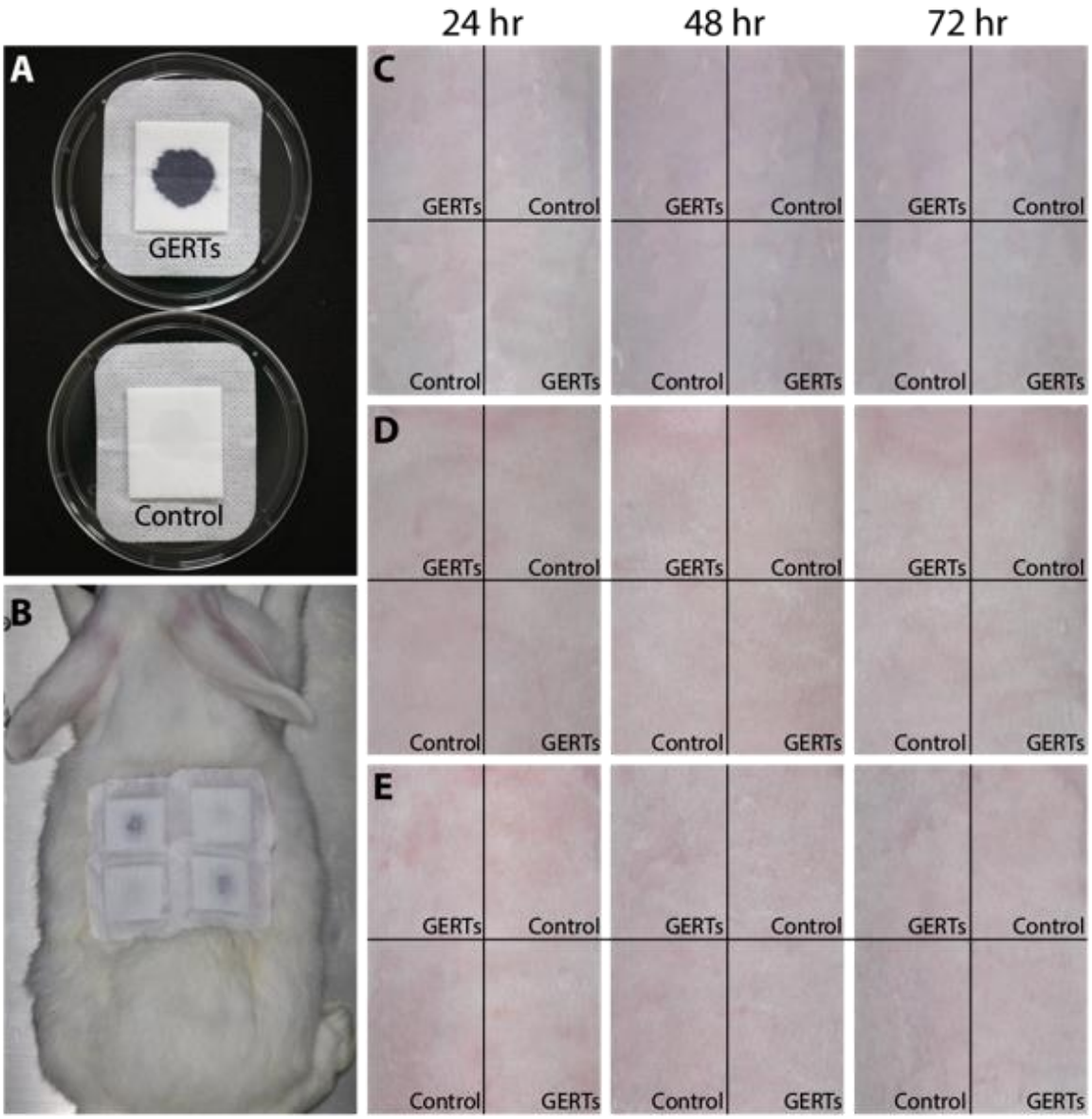

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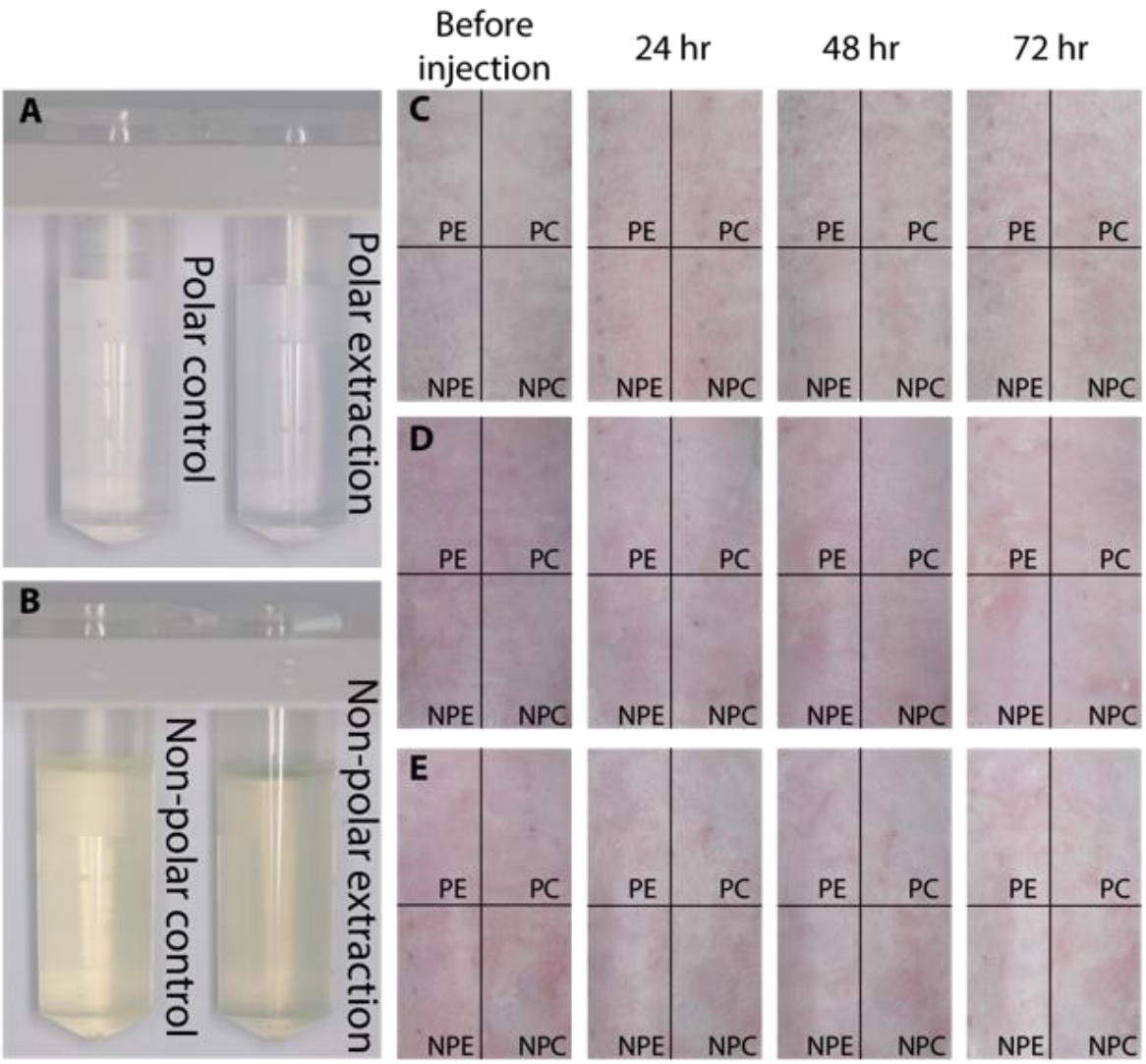

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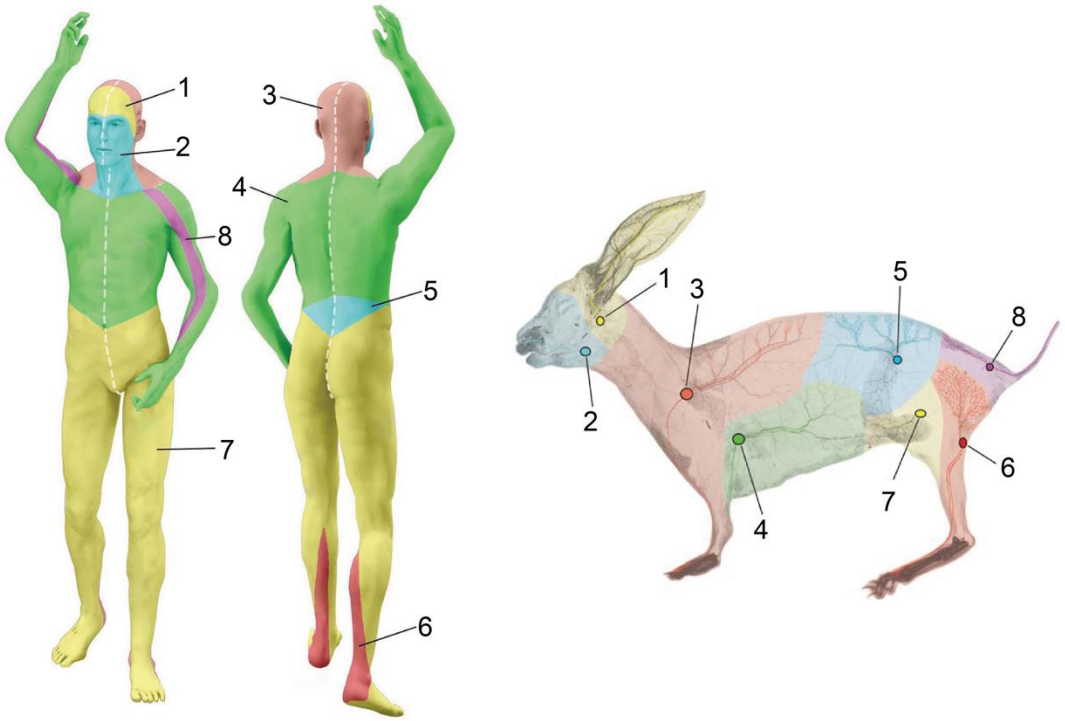

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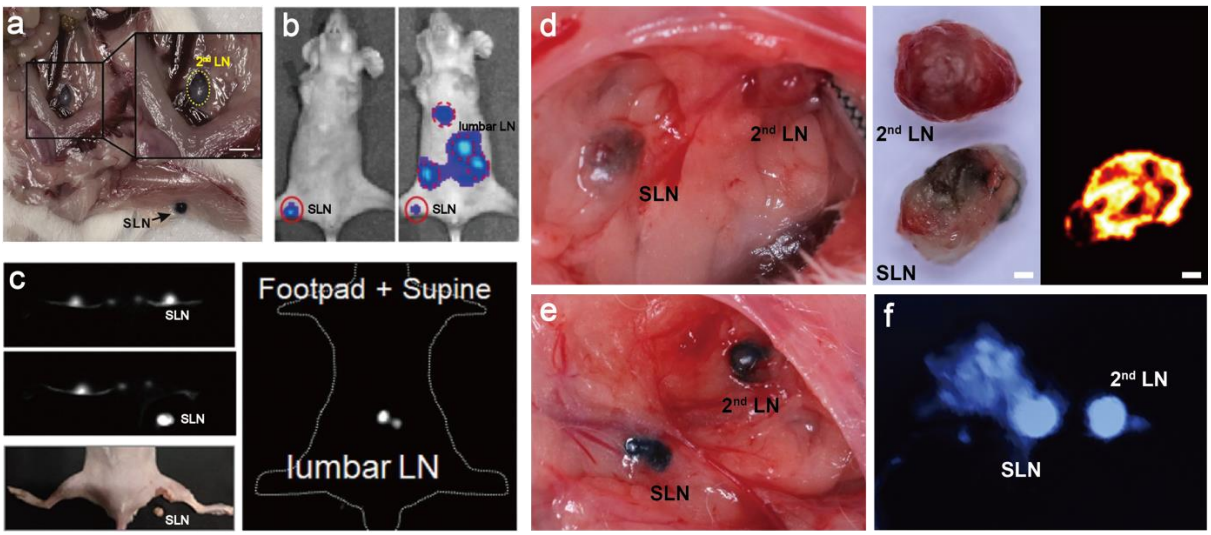

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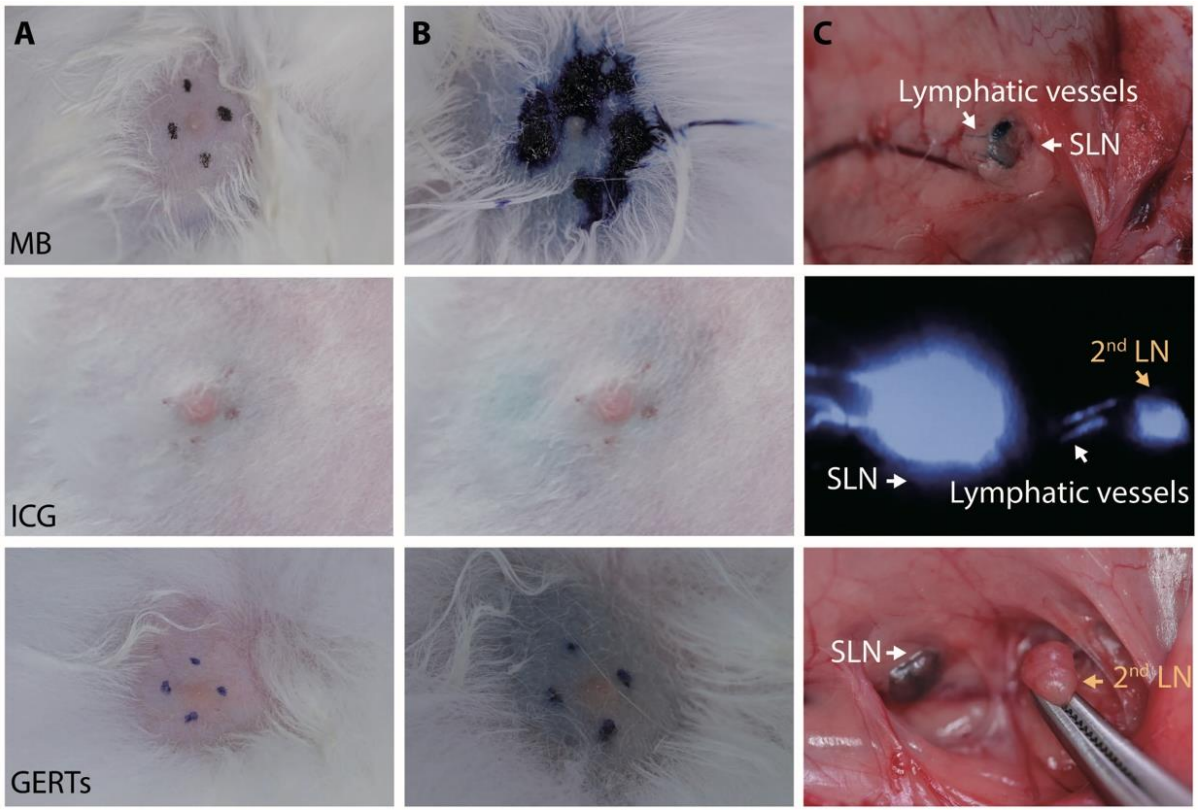

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